

Translation

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

10 DEC 2004

516,311
PCT/JP2003/007293



Applicant's or agent's file reference 03F011-PCT	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/JP2003/007293	International filing date (day/month/year) 09 June 2003 (09.06.2003)	Priority date (day/month/year) 10 June 2002 (10.06.2002)
International Patent Classification (IPC) or national classification and IPC C23C 16/455, H01L 21/31		
Applicant TOKYO ELECTRON LIMITED		

<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>5</u> sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of <u>3</u> sheets.</p>	
<p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the report</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p>	

Date of submission of the demand 18 December 2003 (18.12.2003)	Date of completion of this report 01 September 2004 (01.09.2004)
Name and mailing address of the IPEA/JP	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/JP2003/007293

I. Basis of the report

1. With regard to the elements of the international application:*

- ☐ the international application as originally filed
- ☒ the description:
pages _____ 1-13 _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☒ the claims:
pages _____ 2-8 _____, as originally filed
pages _____, as amended (together with any statement under Article 19
pages _____, filed with the demand
pages _____ 1, 9-13 _____, filed with the letter of _____ 26 March 2004 (26.03.2004)
- ☒ the drawings:
pages _____ 1-7 _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☐ the sequence listing part of the description:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

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V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	2-8, 9, 10	YES
	Claims	1, 11-13	NO
Inventive step (IS)	Claims	2-8	YES
	Claims	1, 9-13	NO
Industrial applicability (IA)	Claims	1-13	YES
	Claims		NO

2. Citations and explanations

Document 1: JP 08-279465 A (Hitachi Cable, Ltd.), 22 October 1996

Document 2: JP 64-054723 A (Sony Corp.), 2 March 1989

Document 3: JP 61-077696 A (NEC Corp.), 21 April 1986

Document 4: JP 11-269652 A (NEC Corp.), 5 October 1999

Document 5: JP 2000-269147 A (Shin-Etsu Handotai Co., Ltd.), 29 September 2000

Claims 1 and 11-13

The inventions set forth in claims 1 and 11-13 are not novel over documents 1-3, cited in the international search report.

The claims of documents 1-3 disclose devices for forming thin films wherein the cross-section of the gas flow path gradually decreases as it passes from the gas supply port towards the gas discharge port.

Document 1 in particular discloses the feature of making the cross-sectional area of the flow channel inversely proportional to the distance from the upstream end where the gas first assumes laminar flow so as to maintain the thickness of the boundary layer constant in the direction of flow.

Claims 9 and 10

The inventions set forth in claims 9 and 10 do not involve an inventive step in the light of document 1, cited in the international search report.

The device in document 1 also has a "gas jet" in the gas inlet component. In devices for gas phase growth it is common to have a gas dispersing component having a plurality of gas supply holes arranged in parallel in order to give uniform introduction of gas (see newly cited document 5, if necessary), and adoption of a gas dispersing component having a plurality of gas supply holes arranged in parallel as the gas jet disclosed in document 1 is a suitable option available to a person skilled in the art.

Claims 2-8

The inventions set forth in claims 2-8 are not disclosed in any of the documents cited in the international search report, and are novel and involve an inventive step.

Although the inventions disclosed in documents 1-3 disclose a constitution wherein the cross-section of the gas flow path narrows in order to give a uniform membrane thickness, they are conventional devices for gas phase growth and, therefore, do not disclose having "gas supply means for interchangeable supply of a plurality of gasses". The essential feature of a general atomic layer deposition method having "gas supply means for interchangeable supply of a plurality of gasses", as disclosed in document 4, on the other hand, is that the film thickness is homogeneous at the atomic level, and, therefore, there would be no reason for a person skilled in the art to apply the feature disclosed in documents 1-3 wherein the cross-section of the gas flow path gradually decreases in the general atomic layer deposition method

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disclosed in document 4.